Electronic Version
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Claims

[c1] A valve for use with a control line disposed in a wellbore, comprising:
a shuttle valve functionally connected to the control line;
the shuttle valve adapted to enable pressure transfer through the control line from both a downhole and an uphole direction during normal operating conditions; and
the shuttle valve adapted to seal the control line when a pressure spike occurs from the downhole direction.

[c2] The valve of claim 1, wherein the pressure spike comprises a blow-out in the wellbore.

[c3] The valve of claim 1, wherein the shuttle valve is disposed in the control line.

[c4] The valve of claim 1, wherein the shuttle valve is located in a housing.

[c5] The valve of claim 4, wherein the housing is a joint that connects two tubing pieces together.

[c6] The valve of claim 1, wherein the control line is functionally connected to a downhole tool.

[c7] The valve of claim 6, wherein the downhole tool comprises a valve, a packer or a perforating gun.

[c8] The valve of claim 1, wherein the shuttle valve comprises a shuttle slidingly disposed within an orifice located on a constrictor in the housing.

[c9] The valve of claim 8, wherein the constrictor includes at least one opening to allow fluid flow therethrough.

[c10] The valve of claim 9, wherein the shuttle is movable between a first position, in which a first shuttle surface seals against a first housing surface to prevent flow of fluids from the downhole direction, and a second position, in which a second shuttle surface seals against a second housing surface to prevent flow of fluids from the uphole direction.

[c11] The valve of claim 10, further comprising:
two springs;
wherein each spring provides a counter-force to one of the sliding movement directions of the shuttle;
so that the first position is reached when the counter-force of one spring is exceeded by the pressure from the downhole direction and the second position is reached when the counter-force of the other spring is exceeded by the pressure from the uphole direction.

[c12] The valve of claim 8, further comprising at least one spring providing a counter-force to the sliding movement of the shuttle in one direction.

[c13] The valve of claim 12, further comprising two springs, each spring providing a counter-force to one of the sliding movement directions of the shuttle.

[c14] The valve of claim 1, wherein the shuttle valve comprises a shuttle slidingly disposed within a cavity in the housing and the shuttle transfers pressure within the control line.

[c15] The valve of claim 14, wherein the shuttle includes at least one dynamic seal to enable a sealing and sliding movement of the shuttle against the cavity.

[c16] The valve of claim 14, wherein the shuttle is movable between two normal operating positions, a first position in which a first volume remains in the cavity adjacent the first end of the shuttle and a second position in which a second volume remains in the cavity adjacent the second end of the shuttle.

[c17] The valve of claim 16, wherein the shuttle includes a downhole pressure spike position wherein the second shuttle end abuts the uphole surface of the cavity and does not allow pressure communication from the down-

hole direction.

[c18] The valve of claim 14, further comprising:
a passageway through the shuttle; and
a rupture disk selectively prohibiting flow through the passageway.

[c19] The valve of claim 18, wherein the rupture disk is ruptured by pressure from the uphole direction thereby allowing fluid communication through the passageway.

[c20] A system for preventing blow-outs in a welbore including a control line, comprising:
a safety valve adapted to seal a tubing disposed in the wellbore in case of a blow-out;
a wellhead adapted to seal an annulus between the tubing and the wellbore in case of a blow-out; and
a valve adapted to seal the control line in case of a blow-out, wherein the valve enables pressure transfer through the control line from both a downhole and an uphole direction during normal operating conditions.

[c21] The system of claim 20, wherein the valve comprises a shuttle valve.

[c22] The system of claim 21, wherein the shuttle valve is located in a housing.

[c23] The system of claim 22, wherein the housing is a joint that connects two tubing pieces together.

[c24] The system of claim 20, wherein the control line is functionally connected to a downhole tool.

[c25] The system of claim 24, wherein the control line is used to hydraulically actuate the downhole tool.

[c26] The system of claim 24, wherein the downhole tool comprises a valve, a packer or a perforating gun.

[c27] A method for preventing blow-outs in a welbore including a control line, comprising:
sealing a tubing in the wellbore with a safety valve in case of a blow-out;
sealing an annulus between the tubing and the wellbore with a wellhead in case of a blow-out;
sealing the control line with a valve in case of a blow-out; and
transferring pressure through the valve and control line from both a downhole and an uphole direction during normal operating conditions.

[c28] The method of claim 27, wherein the transferring step comprises shuttling the valve in the uphole and downhole directions depending on the direction of the higher pressure.

[c29] The method of claim 27, further comprising functionally connecting the control line to a downhole tool.

[c30] The method of claim 29, further comprising hydraulically actuating the downhole tool through the control line.

[c31] The method of claim 28, further comprising biasing the shuttling movement of the valve in at least one direction.

[c32] The method of claim 31, further comprising biasing the shuttling movement of the valve in both the downhole and uphole directions.

[c33] The method of claim 32, wherein the biasing step comprises providing two springs, each spring providing a counter-force to one of the sliding movement directions of the shuttle.

[c34] The method of claim 32, wherein the biasing step comprises providing excess volume in a cavity that houses the shuttle.

[c35] The method of claim 27, further comprising providing a shuttle sealingly slidingly disposed within a cavity in a housing.

[c36] The method of claim 35, wherein the shuttle prevents fluid communication in the control line.

[c37] The method of claim 36, further comprising rupturing a disk in the shuttle to enable fluid communication across the shuttle through a passageway in the shuttle.

[c38] A barrier for use with a control line disposed in a well-bore, comprising:
a valve functionally connected to the control line;
the valve adapted to enable pressure transfer through the control line from both a downhole and an uphole direction during normal operating conditions; and
the valve adapted to seal the control line when a pressure spike occurs from the downhole direction.

[c39] A method for preventing blow-outs in a welbore including a control line, comprising:
sealing the control line with a valve in case of a blow-out; and
transferring pressure through the valve and control line from both a downhole and an uphole direction during normal operating conditions.

[c40] A system for preventing blow-outs in a welbore including a control line, comprising:
at least two valves adapted to seal the control line in case of a blow-out, wherein each of the valves enables pressure transfer through the control line from both a

downhole and an uphole direction during normal operating conditions;

wherein the control line is used to hydraulically actuate at least two downhole tools; and

wherein the at least two valves are adapted to enable the selective actuation of the at least two downhole tools.

[c41] The system of claim 40, wherein:

each of the valves includes at least one spring providing a counterforce to a movement of the valve; and

wherein the springs of the valves are rated to enable the selective actuation of the at least two downhole tools.